

APR 4 1963

Dear Mr. Woodyear:

Submitted herein are the principal results of a valuation of the Foreign Service Retirement System as of December 31, 1961.

As performed by this office, this valuation is essentially a year by year projection of receipts and benefits for two separate categories as follows:

- (1) Active and retired officers as of December 31, 1961, as well as survivors on the roll as of that date.
- (2) Typical groups of new entrants entering during each and every year in the future ad infinitum.

The combination of the two categories gives a projection of the expected operation of the entire system. This combination is shown in the attached table.

A discounting at interest of the first category produces the assets and liabilities of the system with respect to the existing active and retired force. The liabilities minus the assets and minus the fund produces the unfunded liability (footnoted in the attached table).

A discounting of the second category enables one to find the ratio of discounted benefits to discounted payroll with respect to new entrants. This ratio is defined as the normal or new entrant cost. These results are shown by entry age groups below:

<u>Entry age</u>	<u>Normal cost</u>	
	<u>at 3% interest</u>	<u>at 4% interest</u>
below 30	30.4%	23.5%
30 through 40	40.0	32.1
above 40	63.5	54.1
All groups combined	35.9%	29.7%

In regard to category (1), no matter what the method of financing, the liabilities can only be equal to the discounted value of the benefits. On the asset side, however, one can use the realistic approach and find the dis-

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counted value of the Government's matching 6 $\frac{1}{2}$ % contribution along with discounted employee contributions, or one can find the discounted value of the hypothetical normal cost in place of these. Since the normal cost far exceeds the actual contributions received in the case of the Foreign Service Retirement System, the realistic approach produces a much larger unfunded liability than the hypothetical normal cost approach. In the attached table the unfunded liability is shown on both a realistic and a normal cost basis.

Although the concept of projecting year by year receipts and benefits is simplicity itself, the job of making such a projection is rather complex. Many assumptions based upon the past experience of the system go into making the projection. Obviously, the projection is only as good as these assumptions.

With the present provision for staff people to enter the system after 10 years of service, the average entry age into the system has risen from 27 $\frac{1}{2}$  years used in the 1958 valuation to an average of 30 in the valuation of 1961. This figure of 30 is based upon the distribution of new entrants in calendar year 1962 which, it is understood, has been considered to be a typical year for new entrants. Although about 400 new entrants came into the system in 1962, it has been decided that for projection purposes it can be assumed that there will be about 350 new entrants each year in the future. According to the 1962 distribution these 350 new entrants fall into three groups as follows:

<u>Entry age</u>	<u>Average entry age</u>	<u>Number</u>	<u>Percentage</u>
Below 30	25	220	63%
30 through 40	34	83	24
above 40	46	47	13
Total	30	350	100%

The following percentage distributions are of interest:

<u>Entry age</u>	<u>Dec. 1961 active force</u>	<u>Ultimate active force</u>	<u>Retirements 1950-61</u>	<u>Retirements, ultimate</u>
below 30	36%	70%	21%	55%
30 through 40	34	22	12	27
above 40	30	8	67	18
	100%	100%	100%	100%

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The percentages for active force and retirements show very clearly that as of December 31, 1961 the system contained an excessive number of older officers when compared to the ultimate situation expected to evolve based upon a continuation of the 1962 new entrant distribution.

In the 1961 valuation the normal cost for entry age 25 was found by projecting 220 new entrants each year in perpetuity and then discounting the benefits and payroll. As stated earlier, the discounted value of benefits as a percentage of discounted payroll represents the normal cost. The same was done for entry ages 34 and 46. Then all three entry age projections were combined and discounted to produce the total normal cost. These results at two different rates of interest were shown in the first table presented above.

In the valuation of 1958 a total normal cost of 20.88% was produced. This was based on the assumption that all new entrants came in at the age of 27½. In the current valuation, the only group at all comparable to the 1958 valuation is the entry age 25 group. In comparing the two, it is noted first that the cost for the entry age 25 group is greater even though the age is lower. In explanation, the first important difference is the liberalization of the law to permit the use of the Civil Service formula in the case of survivor elections. This led to more survivor electors with less reduction in the officer's annuity. A breakdown of benefits as a percentage of payroll on a normal cost basis is shown below for comparison purposes.

	Dec. 31, 1958 valuation, <u>entry age 27½</u>	Dec. 31, 1961 valuation, <u>entry age 25 only</u>
<b>Retirement annuities:</b>		
Age and Service	17.18%	18.41%
Disability	.70	.28
<b>Survivor annuities:</b>		
Death after service retirement	1.02	2.61
Death after disability retirement	.17	.07
Death in service	1.01	1.43
<b>Return of future contributions:</b>		
On death in service	.11	.08
On withdrawal	.33	.43

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## Deferred annuities:

Annuities

.36\*

.15

Refunds awaiting annuity

.01

Total

20.88%

23.47%

\* Includes lump sum benefits on selection-out.

The above figures indicate significant increases in cost, particularly retirement and survivor benefits. (On the basis of the 1959-61 experience, disability cases fell off markedly.)

A comparison of percentages on survivor elections is shown below for entry ages 27½ and 25:

	1958 valuation (assumed ultimate for entry age 27½)	1961 valuation (assumed ultimate for entry age 25)
(a) Percentage of service annuitants electing joint and survivor annuities	50%	90%
(b) Average reduced officer annuity as percentage of full annuity	81%	94%
(c) Average survivor annuity as percentage of full annuity	35%	50%
(d) Average officer annuity as percentage of full annuity = (a)(b) + (100% - a)(100%) =	90%	95%
(e) Widow annuity potential = (a)(c)	18%	45%

Lines (d) and (e) above represent a crude basis for gauging the increase in annuity cost because of the change in the survivor election formula. Using these ratios in conjunction with normal cost figures for service retirement and survivor benefits we get:

from (d),	$\frac{95\%}{90\%} \times 17.18\% =$	18.13%
and from (e),	$\frac{45\%}{18\%} \times 1.02\% =$	2.55%

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These results approach the 1961 normal cost figures for age and service annuities and survivor annuities after death in service.

Another reason for increased normal cost is that the salary curve for entry 25 used in 1961 is slightly steeper than the one used for entry 27½ in 1958. Obviously, this would cause the benefits which are based upon final average salary to be higher relative to the lifetime salaries on which the contributions are based, thus increasing the normal cost.

The above paragraphs are in defense of the normal cost for entry age 25 only. Considering entry age group 46 it is fairly obvious that these people enter the system with a great deal of service credit already earned. The contributions which are brought in are only their own, and these are based upon salaries which diminish rapidly toward the earlier years. None of the Government's contributions are transferred. The result is that these people retire on relatively high annuities and most of the normal cost must be spread over a short period of service. For example, suppose an officer enters at age 45, serves for 10 years and then retires on an annuity based on 25 or 30 years of service. That is, he retires on 50% or 60% of final average pay. If then he lives for 20 years after retirement, he will receive in benefits over 100% of what he earned in salary under the system. In the light of this type of example a normal cost of 54% does not seem unreasonable.

In comparing the normal cost for entry age 25 only with the normal cost of Civil Service, there are many reasons why the cost of Foreign Service is much greater. (The average entry age for Civil Service is about 27 years.)

If the salary scales are compared it is found that between age 25 and age 55 the salary ratio is 3.36 under Foreign Service compared to 1.42 under Civil Service. The top end of the Foreign Service scale is heavily weighted by salaries at the ambassador level.

Resignation rates are lower at the young ages under Foreign Service and taper off very rapidly, whereas they persist at a relatively high level under Civil Service. In other words, for every 100 that enter Foreign Service at age 25, 57 reach service retirement, while under Civil Service for every 100 entering at age 25, only 13 reach service retirement, a ratio of less than 1 to 4. This is reflected in the fact that on a 3% basis and entry age 25 the normal cost for service retirement under Foreign Service is 23.81% compared to 6.09% under Civil Service.

According to Civil Service actuarial tables the average age of retirement is about 60 compared to about 57½ years under Foreign Service for entry

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age group 25. This, of course, also contributes to higher normal cost. In this connection, it is needless to say that the "50-20" provision in Foreign Service is much more expensive than the retirement provisions under Civil Service.

Still another reason for Civil Service's relatively low normal cost is the fact that no allowance is made for creditable service which a new entrant may have when entering the system. It is understood that such credit would show up as a liability in their valuation but would not be reflected in the normal cost.

The Foreign Service valuation of 1961 was not submitted as an official valuation report for the following reasons:

- (1) The valuation was not finished until after the first of calendar year 1963, by which time the 1962 pay bill had become effective and an unusually large number of retirements had taken place in 1962 because of a 10% increase in annuity which would have been lost by delayed retirement. Because of these things the valuation was a little obsolete by the time it was finished. Of particular concern is the fact that the 1962 pay act may have had a significant effect upon the salary curve. The 1961 valuation was based upon the salary structure of December 31, 1961.
- (2) The 1961 valuation was the first Foreign Service valuation to be carried out by means of three entry age groups. It is, in effect, three valuations combined, different rates having been prepared for each group. Because of the increased complexity, more chance for errors of every kind exists.

Because of the above reasons, a new valuation as of December 31, 1962 is already under way. (In fact, it is hoped that a valuation can be produced every year in the future.) Every step, particularly the basic assumptions, will be carefully examined and compared with the valuation just completed. The results should be available well before the end of calendar year 1963.

However, it is believed that neither the normal cost nor the year in which the fund becomes exhausted will change appreciably when determined by a new valuation.

Sincerely yours,

(Signed) Cedric W. Kroll  
Cedric W. Kroll  
Government Actuary

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**FOREIGN SERVICE RETIREMENT SYSTEM**

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(Valuation as of December 31, 1961 by Office of Government Actuary, U. S. Treasury Department)

Estimated future receipts and expenditures of all officers who will have entered the system, either past or future, including benefits to survivors. For the future it is assumed that 350 officers will enter the system each year in perpetuity. On the basis of rates derived from past experience such a group each year will ultimately produce a level force of 7100 active officers. The salary pattern by attained age as it existed on December 31, 1961, has been maintained throughout.

Calendar year	Active officers, Jan. 1	Annual payroll	Employee deductions 6 1/2 %	Transfer of contributions	Agency contributions 6 1/2 %	Investment earnings 4 %	Total receipts	Total expenditures	Fund at end of year
(in 000's)		(All \$ amounts are in millions)							
1962	4.4	47.5	3.1	.5	3.1	1.4	8.1	5.6	35.2*
1963	4.6	49.8	3.2	.5	3.2	1.5	8.4	6.3	37.7
1964	4.7	52.1	3.4	.5	3.4	1.6	8.9	7.0	39.8
1965	4.9	54.3	3.5	.5	3.5	1.7	9.2	7.8	41.7
1966	5.0	56.5	3.7	.5	3.7	1.7	9.6	8.6	43.1
1967	5.2	58.5	3.8	.5	3.8	1.7	9.8	9.5	44.1
1968	5.3	60.6	3.9	.5	3.9	1.7	10.0	10.3	44.4
1969	5.4	62.5	4.1	.5	4.1	1.7	10.4	11.2	44.1
1970	5.5	64.3	4.2	.5	4.2	1.7	10.6	12.3	43.3
1971	5.6	65.9	4.3	.5	4.3	1.6	10.7	13.4	41.6
1972	5.7	67.3	4.4	.5	4.4	1.5	10.8	14.6	38.9
1973	5.8	68.3	4.4	.5	4.4	1.3	10.6	16.2	35.1
1974	5.8	69.3	4.5	.5	4.5	1.0	10.5	17.8	29.5
1975	5.9	70.2	4.6	.5	4.6	.7	10.4	19.3	22.2
1976	6.0	71.2	4.5	.5	4.6	.3	10.0	20.9	13.3
1977	6.0	72.1	4.7	.5	4.7		9.9	22.4	2.4
1978	6.1	72.8	4.7	.5	4.7		9.9	24.0	
1979	6.1	73.7	4.8	.5	4.8		10.1	25.6	
1980	6.2	74.5	4.8	.5	4.8		10.1	27.2	
1990	6.8	85.5	5.6	.5	5.6		11.7	40.0	
2000	7.1	90.7	5.9	.5	5.9		12.3	51.9	
2010	7.1	90.9	5.9	.5	5.9		12.3	61.5	
2020	7.1	90.9	5.9	.5	5.9		12.3	67.3	
2030	7.1	90.9	5.9	.5	5.9		12.3	70.0	
Ultimate	7.1	90.9	5.9	.5	5.9		12.3	70.6	

*no dollar amounts*

\* Estimated fund as of December 31, 1961. On that date estimated unfunded liability on basis of actual expected receipts and expenditures was \$317 million; on a normal cost basis it was \$232 million.

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